0067398

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

05-AMCP-0062

JUN 30 2005

Mr. Ken Niles, Assistant Director
Nuclear Safety Division
Oregon Department of Energy
625 Marion Street NE, Suite 1
Salem, Oregon 97301

Dear Mr. Niles:

RESPONSE TO COMMENTS ON 200-PW-2 URANIUM-RICH PROCESS WASTE GROUP AND THE 200-PW-4 GENERAL PROCESS WASTE GROUP OPERABLE UNITS REMEDIAL INVESTIGATION REPORT, DOE/RL-2004-25, DRAFT A 62114

The U.S. Department of Energy, Richland Operations Office received comments from the Oregon Department of Energy on September 21, 2004, for the subject document. 67397

The initial draft responses to your comments were shared with Dirk Dunning, of your staff, on November 17, 2004. The additional time it has taken to complete the attached final responses to your comments was needed to ensure consistency with the comment resolution efforts being conducted with the State of Washington Department of Ecology which are now nearing completion. Please know that a final draft of the subject report will be sent to you under separate cover in the near future.

If you have questions, please contact me, or your staff may contact Bryan Foley of my staff on (509) 376-7087.

Sincerely,

Matthew S. McCormick, Assistant Manager
for the Central Plateau

AMCP:BLF

Attachment

cc: See page 2

JUN 30 2005

cc w/attach:
D. Bartus, EPA
C. Cameron, EPA
L. D. Crass, FHI
L. J. Cusack, Ecology
S. Harris, CTUIR
J. S. Hertzel, FHI
R. Jim, YN
M. B. Lackey, FHI
T. Martin, HAB
E. J. Murphy-Fitch, FHI
J. Price, Ecology
P. Sobotta, NPT
M. Todd-Robertson, FHI
J. A. Winterhalder, FHI
Administrative Record, H6-08
Environmental Portal

Response to September 16, 2004 letter from Ken Niles, Oregon Department of Energy, to M. McCormick, U.S. Department of Energy, Richland Operations Office

Subject: Comments on the Draft Remedial Investigation Report for the 200-PW-2 Uranium-Rich Process Waste Group and the 200-PW-4 General Process Condensate Group Operable Units, Draft A (DOE/RL-2004-25)

RL and Fluor Hanford, Inc. acknowledge receipt of your comments on the 200-PW-2/200-PW-4 Remedial Investigation (RI) Report (DOE/RL-2004-25, Draft A) and provide the following responses to the comments contained in the referenced letter. Please note that the revision of the work plan for this operable unit (DOE/RL-2000-60, Rev. 1) was recently updated to include the addition of the scope associated with the 200-PW-4 operable unit. The field work associated with this work plan has been completed and reported in the RI report you have provided comments on. No additional field work is planned other than completion of the characterization borehole at the 216-S-7 Crib which was completed on December 29, 2004. The RI for this site will be incorporated into a feasibility study (FS), which has been initiated in support of Tri-Party Agreement Milestone M-15-43C, which is due for submittal to the regulatory agencies on December 31, 2005.

Comment 1:

Operable Unit Division and Groundwater Protection

The report discusses establishing compliance points in the groundwater, but it is unclear how the RI/FS Report will integrate groundwater cleanup actions and protection of groundwater under these sites. Due to the reliance on simplified conceptual site models and numerical fate and transport models, we recommend that the discussion of uncertainty be elevated, and that risk screening values reflect that uncertainty. The FS needs to assess the potential remedial measures available to remediate groundwater contamination over a range of time frames that includes the near term (<50 years).

Comment Background

Division of the source operable units from the groundwater and vadose zone unit causes the decision-makers to have to hypothesize what the future condition of those overlying sites will be and how they will continue to impact groundwater. The estimation of future impacts will be based on uncertain future conditions developed using one or more numerical models that are intended to mathematically emulate the myriad of subsurface conditions and chemical interactions that may occur. Full integration of the groundwater and vadose zone with the source operable units will help to assure that the decisions made are comprehensive and minimize uncertainty. The last bulleted paragraph on page 1-7 in the RI report states, "It is anticipated that groundwater contamination under the Core Zone will preclude beneficial use for the foreseeable future which is at least the period of waste management and institutional controls (150 years)." The FS needs to study and assess the potential remedial measures available to remediate the groundwater contamination over a range of time frames, including the near term (<50 years).

Response:
The source operable unit addresses not only the waste sites but also the vadose zone under the waste sites. Estimates of impacts from the source operable units are incorporated into the RI/FS process to address impacts to both the vadose zone and groundwater with the intent to minimize any further degradation of groundwater. In this manner, there is integration between the programs. Remedial decisions affecting groundwater are generally being made in terms of existing groundwater plumes, with the recognition of any impending impacts that have been identified from the source operable units. The analytical data and baseline risk modeling results from the source operable unit RI report will be used as input data to support future groundwater risk modeling activities. For example, the analytical data and baseline risk modeling results from representative wastes sites in the 200 West Area will be used as input data for the future 200-ZP-1 groundwater baseline risk modeling. See DOE/RL-2003-55, Revision 0, "RI/FS Work Plan for the 200-ZP-1 Groundwater Operable Unit" for more details. For the 200 East Area groundwater investigations are to be carried out under the 200-BP-5 and 200-PO-1 operable units. Sampling and analysis plans (SAP) were prepared for these OUs in 2003.

In the 200-PW-2 and 200-PW-4 operable units, integration is further required because of the Resource Conservation and Recovery Act treatment, storage, and disposal (TSD) units contained within each operable unit and the need to address groundwater within each TSD unit closure plan. The source operable unit's feasibility study, which has been initiated, will address these aspects. Separate FS's will be prepared for groundwater operable units in the 200 Area. These documents will assess potential groundwater remedial measures over a range of time frames as requested. The FS for the 200-UP-1 groundwater operable unit is scheduled to begin in Fiscal Year (FY) 2006, while the FS for the 200-ZP-1 groundwater operable unit is scheduled to begin in FY 2007. Uncertainties associated with the nature and lateral extent of the contamination in the vadose zone, difficulties associated with remediation of deep vadose zone contamination, and assumptions associated with modeling are recognized and will be addressed in the source and groundwater OU feasibility studies. Some of these issues will be addressed in a treatability investigation of technetium-99 that has been requested by EPA and Ecology.

Comment 2
Groundwater Analysis
We are reviewing the work plan for aquifer testing including how test decisions will be made, which intervals will be tested, or what methods will be employed. We anticipate submitting separate comments on those plans when we complete our review.

Response:
The 200-PW-2/4 Work Plan does not include aquifer testing. For more information about activities planned as part of the groundwater program scope in the 200 West Area please refer to DOE/RL-2003-55, Rev. 0, "RI/FS Work Plan for the 200-ZP-1 Groundwater Operable Unit," Section 5.1.6 Aquifer Testing, and DOE/RL-92-76, Rev. 1, Draft B, "RI/FS Work Plan for the 200-UP-1 Groundwater Operable Unit," Section 5.1.6 Aquifer Testing. Similar approaches are being planned for the 200 East area groundwater plumes (200-BP-5 and 200-PO-1).

Comment 3
Conceptual Site Model
The analysis in the report is based on a site conceptual model which primarily assumes direct vertical transport of water through the soil column, with little consideration of lateral transport. DOE needs to develop field data to support the lack of lateral transport. Work with drive casings this past summer, and other work in the past, showed evidence of lateral spread of contaminants. To improve both the conceptual site model and numerical modeling accuracy, Oregon recommends that DOE collect continuous core samples, and follow a pre-developed sample selection and analysis strategy to develop site-specific and bulk soil information. This information will also support remedial decision making. We expect that caps and covers will be evaluated, along with other remedial strategies. Implicit in the use of caps and covers is the assumption that the nature and extent of contamination is known, and that the subsurface movement of water is well understood. We recommend that the presumption that water moves only vertically and not laterally be challenged and tested prior to selecting capping as a remedy.

Comment Background
There is evidence that lateral transport of waste has occurred at many sites across the plateau. Field investigations, such as the work at the vadose zone observatory, also support this hypothesis. The data in the report provide little information on the potential lateral spread of contamination or of contaminant movement, or to allow the decision makers the information needed to have adequate confidence that the size of the contaminated area is well known. Consequently, alternative analysis in the FS would be based on assumptions about the areal extent of these sites both at the surface and in the subsurface. Use of bulk soil samples that average the soil properties may provide general lithologic information suitable for input into the numerical fate and transport model. However, this may easily overlook key small-scale geologic features that locally influence or control soilwater and groundwater movement, and invalidate the conceptual model. Focused sampling of small-scale geologic features that could significantly affect fate and transport may assist evaluation of the site conceptual model, yet fail to provide site-specific parameters needed for modeling. Using continuous core samples allows analysis to be either interval discrete or composited over an interval. The detailed selection procedure should be specified in the final revision of the RI/FS work plan to help minimize future uncertainty. Significant lateral movement of water and contaminants has importance not only for the fate and transport of waste, but also for the infiltration of water beneath any cap and cover

that is used. Lateral transport of water has the potential to render caps and covers non-protective. Caps and covers may give a false sense of assurance that movement of waste and water has been mitigated. The resulting consequences may be severe, and the costs of redoing the remedy may be large.

Response:
The purpose of capping waste sites is to significantly reduce future water infiltration (e.g., natural precipitation) which is the primary driver for contaminant transport in the vadose zone. The majority of transport in the 200-PW-2 and 200-PW-4 sites has been vertical and was driven by large historical volumes of liquid. Lateral transport is discussed in sections 3.3.1.2 and 3.3.1.3 of DOE/RL-98-28, "200 Areas RI/FS Implementation Plan," and again in section 6.2 where characterization strategies are discussed. It is generally recognized that the degree of lateral spreading is affected by the characteristics of the sediments into which contaminants are discharged. The conceptual models developed for each of the representative waste sites acknowledged the potential for and/or actual lateral spreading in the discussions contained within section 3.3.2 of the 200-PW-2/4 work plan (DOE/RL-2000-60). This is again noted in the RI report discussion of conceptual models and fate and transport modeling.

The sample selection, collection and analysis strategy was a pre-developed effort. The RI has been completed in accordance with the sampling design established in the data quality objective (DQO) processes documented in BHI-01411, CP-14176 and CP14682. Samples were collected as prescribed in the SAP (Appendix B) of the approved work plan (DOE/RL-2000-60, Revision 1) which included specific samples for physical property measurements. As defined during the DQO process, specific sample intervals were identified on the basis of things such as anticipated changes in lithology or expected transitions in contaminant concentrations.

A large number of boreholes are associated with the 200-PW-2 and 200-PW-4 OU waste sites; many were gamma-logged for the work plan or the RI. The borehole summary report, CP-18666, contains details of the stratigraphy encountered during drilling. The RI Report contains geological information, including geologic history and framework, hydrostratigraphy and topography for the waste sites in the 200 Areas. In addition, the RI Report contains a stratigraphic profile for each borehole that was newly drilled and gamma logged and/or sampled as part of the RI field work.

Any information gained by continuous core sampling and subsequent bulk soil analysis would not be likely to affect decision making, and the information would be obtained at a relatively high cost in terms of both time and budget. Following the Record of Decision for these waste sites, there are planned opportunities to collect additional information that can be used to support remedial design needs, confirm conceptual models, and verify applicability of conceptual models to analogous waste sites. Additional boreholes to help delineate the extent of lateral spreading will be required if a capping alternative is selected; the collection of continuous core samples from these boreholes may be considered if needed to support remedial design. Bulk soil information for the Hanford Site is generally available in sufficient quantity for determination of properties used for modeling purposes.

Citations in response:

BHI-01411, 2001, "Remedial Investigation Data Quality Objectives Summary Report for the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit," Revision 0, Bechtel Hanford, Inc., Richland, Washington.
CP-14176, 2003, "Remedial Investigation Data Quality Objectives Summary Report for the 200-PW-4 Operable Unit," Revision. 0, Fluor Hanford, Inc., Richland, Washington.
CP-14682, 2003, "Data Quality Objectives Summary Report for the Designation of the 200-PW-2 and 200-PW-4 Investigation-Derived Wastes," Revision 0, Fluor Hanford, Inc, Richland, Washington.
CP-18666, 2004, "200-PW-2 and 200-PW-4 Operable Unit Borehole Summary Report," Revision 0, Fluor Hanford, Inc., Richland, Washington.
DOE/RL-98-28, 1999, "200 Areas Remedial Investigation/Feasibility Study Implementation Plan – Environmental Restoration Program," Revision 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington
DOE/RL-2000-60, 2004, "Uranium Rich/General Process Condensate and Process Waste Group Operable Units RI/FS Work Plan and RCRA TSD Unit Sampling Plan; Includes 200-PW-2 and 200-PW-4 Operable Units," Revision 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Comment 4

Contaminant Transport and Kd

The report seems to assume that lab-derived Kd values for each contaminant are equally applicable to all sites, and that Kd based models are appropriate. The data presented in the report refute this hypothesis. Additional work is needed to determine why contaminants are moving, and whether specific adjustments are needed that might allow RESRAD or an alternate numerical model to adequately bound the risks. Further, we recommend that variability analysis be conducted on input parameters in an effort to identify the magnitude of the sensitivity of the output due to model parameter variations, conceptual model assumptions and the underlying numerical code architecture.

Comment Background

The report relies on analyzing the potential for the movement of various contaminants of potential concern by using Kd values and the computer code RESRAD. Data presented in the report strongly challenge the notion that Kd modeling adequately describes the movement of wastes under these sites. Many of the sites (such as Trench 216-A-19, Crib 216-A-37-1, and 216-U-8) show deep movement of contaminants that cannot be explained based on the Kd values that have been assigned. The contaminant profiles presented for the various waste sites do not provide confidence for the Kd values assigned, and in turn the sufficiency of RESRAD for estimating the protection of groundwater. This increases the uncertainty in the risk estimate and raises questions as to whether the uncertainty may greatly exceed the calculated risk. Each of these challenge the reliability, usefulness and protectiveness provided by estimating risk using the RESRAD codes.

Response:
Historically, many 200-PW-2/4 waste sites had large quantities of water discharged to them. Under these past conditions it is highly likely that a combination of high infiltration rates and high concentrations of dissolved contaminants overwhelmed the sorptive properties of the soils. Under such conditions, the Kd models may not be accurate. However, in the 200-PW-2/4 RI report, Kd values are applied to predict possible future migration under existing conditions of low infiltration where the Kd model should be applicable.

With respect to the question of whether the Kds are applicable to the specific waste sites, please refer to the following language in the RI Report Section 4.4.2 and subsequent discussions in Sections 5.2 through 5.3. The Kd values used were specifically developed for Hanford 200 Areas. "Kd values used preferentially in the RESRAD simulations were 'conservative' values from Table E.15 of the 200 Area Composite Analysis (PNNL11800). Source Category "F" Kd values, corresponding to low organic/low salts/near neutral pH releases, were used for all sites excepting the 216-A-10 Crib. The 216-A-10 Crib was assigned Category "H" Kd values, corresponding to low organic/low salts/very acidic releases. The category "H" Kd values pertain to a high-impact zone near the release point. However, because contaminant depth profiles at the 216-A-10 Crib indicate that liquid releases historically reached groundwater, the Category "H" Kd values were applied for modeling across the entire vadose zone."

Citation in response:

PNNL-11800, 1998, "Composite Analysis for Low-Level Waste Disposal in the 200 Area Plateau of the Hanford Site," Pacific Northwest National Laboratory, Richland, Washington.

Comment 5
Land Use
Land use for the central plateau is stated to be industrial, which mirrors the CLUP. However, as noted in the recent Hanford Solid Waste Environmental Impact Study (HSW EIS), the existing sites will be cleaned up to protect groundwater. Also, the recent 200 Area end states work shop indicated a general agreement that uses beyond 50 years will be wide ranging. ODOE recommends that the document be revised to reflect the 50 year CLUP duration and the public sentiment for uncertain use thereafter.

Response:
The basis for using an industrial scenario is presented in Section 1.3.2 which reflects the Tri-Parties' response to Hanford Advisory Board #132 advice, the Comprehensive Land Use Plan Environmental Impact Statement, and other sources of information. The HSW EIS did not change the land use of the Central Plateau, and states that it will continue its industrial use. Additional clarification regarding the suggested uncertainties associated with future use will be added. The protection of groundwater will be considered during development of preliminary remediation goals in the feasibility study for these operable units.

Citations in response:

DOE/EIS-0222-F, 1999, "Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement," U.S. Department of Energy, Washington, D.C.
DOE/EIS-0286F, 2004, "Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement", Richland, Benton County, Washington
Klein, K.A., Einan, D.R., and Wilson, M.A., 2002, "Consensus Advice #132: Exposure Scenarios Task Force on the 200 Area," (letter to Mr. Todd Martin, Hanford Advisory Board, from Keith A. Klein, U.S. Department of Energy; David R. Einan, U.S. Environmental Protection Agency; and Michael A. Wilson, State of Washington, Department of Ecology), Richland, Washington.

Comment 6

Screening Level Analysis of Ecological Risk

The report indicates that DOE intends to use its internal guidance for ecological risk evaluation and asserts that this is a conservative assessment of the risk. We do not agree. We encourage the Tri-Parties to use established U.S. Environmental Protection Agency (EPA) metrics for ecological assessment to do data collection and evaluation.

Comment Background

We are not aware of literature that assigns impacts to ecological resources in units of BCG levels as set under DOE's process, and hence we have no means to validate assertions that particular BCG levels are protective. Using the BCGs to establish the required analytical capabilities, without evaluating the data needs for Natural Resource Injury evaluation, risks not analyzing to sufficiently precise levels to satisfy both needs. This may necessitate redoing large amounts of sampling later at much greater total cost.

Response:

The ecological risk evaluation methodology described in Section 1.3.4 recognizes the EPA guidance document (EPA/540/R-97/006) and has discussed this approach in further detail in the Central Plateau Ecological Evaluation Report (DOE/RL-2001-54). Section 4.5 of the RI report discusses this risk screening process in further detail.

Unfortunately, the Draft A version of the 200-PW-2/4 RI report preceded the development of the screening process used in the recent Central Plateau Ecological DQO for radiological contaminants of potential ecological concern (COPECS). Consequently, the Draft A version of the RI is not consistent with the Central Plateau Ecological DQO. The RI will therefore be revised for consistency with this document, and the COPEC evaluation will be performed by the same ecological risk assessors that authored the Central Plateau Ecological DQO report.

Citations in response:
EPA/540/R-97/006, 1997, "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments," U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
WMP-20570, "Ecological Data Quality Objectives Summary Report For the Hanford Central Plateau" (DRAFT)

Comment 7
Natural Resources
Natural Resource Injury needs to be evaluated and weighed in the remedial decision evaluation by the decision-makers in reaching RODs. There is a growing record of sites doing cleanups under the active remedial portion of CERCLA, and then having to extend these cleanups later when analysis of ecosystem impacts is made under the Natural Resource Damage provisions of CERCLA. It appears to us that combining these actions into one unified process and evaluation best uses precious resources and protects both human health and the ecology.

Response:
DOE has agreed that if a natural resources data need coincides with an RI/FS data collection process, then the natural resources data need would be considered. The issue is that, before that need can be fulfilled, an understanding must be developed of how the ecological risk needs will be met and data are to be collected. While no more information is to be collected in the RI portion of the 200-PW-2/4 RI/FS process, additional data needs will be considered in the future in order to ensure that data are collected to support completion of the ecological risk assessment.

In order to prioritize efforts in assuring the restoration and minimization of potential impacts to natural resources as a result of or during cleanup of, releases associated with the Hanford Site, DOE has agreed to:

- Focus on ecological risk assessments.

- Focus on incorporating potential injury assessment data into the ecological risk assessments in order to support remedial action decisions or as the collection of injury assessment data makes sense.

- Injury assessment data that exclusively supports damage assessment will be addressed later.